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EXAMINER

ENG, MARSHALL S

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 07/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/808,325

Applicant(s)

ILLMAN, RICHARD

Examin r

Marshall S Eng

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figures 1a and 1b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to because in Figure 2b, step 14 states "Copy original fault list to G sub 0." However line 19 of page 5 of the specifications state "the original fault list F sub 0 is again copied and denoted as fault list G sub M (step 14)." It appears that the G sub 0 in Figure 2b should be G sub M.
3. The drawings are further objected to because Figure 3 uses the same symbol for two different operations. A solid line with an arrow at the right end is used to designate both "Data used as input to a process" and "Data output from a process."
4. The drawings are further objected to because the references to steps 10, 12, 14, 16, 18, and 20 of Figures 2a, 2b, and 2c are not legible.
5. The drawings are further objected to because the drawings fail to be in compliance with 37 CFR 1.84 paragraph L: "All drawings must be made by a process which will give them satisfactory reproduction characteristics. Every line, number, and letter must be durable, clean, black, sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction."

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Specifically, the first sentence of the abstract repeats the title and there should only be one paragraph.

7. The disclosure is objected to because of the following informalities: the first use of the word fault coverage in line 5 of page 1 does not use quotes. All other words that were defined in the specification were put in quotes for its first use. See "test vectors" on line 4 of page 1, "scan chain" on line 12 of page 1, and "stuck-at" on line 20 of page. Also, on line 17 of page 1, the quotes should be removed from around fault coverage if the quotes are added to line 5.

8. The disclosure is further objected to because of the following informalities: the word "circuits" on line 12 of page 1 should apparently be "circuit."

9. The disclosure is further objected to because of the following informalities: the word "is" on line 27 of page 1 should apparently be "are" to agree with methods.

10. The disclosure is further objected to because of the following informalities: the specifications refer to Figure 1 as both a test vector (line 6 of page 2) and as prior art examples of scan chains (line 12 of page 2).

11. The disclosure is further objected to because of the following informalities: the end of step e on line 12 of page 3 reads "faults, and." It apparently should be "faults;" since it is not the last step of the method.

12. The disclosure is further objected to because of the following informalities: step f of page 3 should apparently be split into 2 steps to create and save T sub 1 through T sub M. Also, on line 14 of page 3, it appears that steps "c) to f)" should be repeated instead of steps "a) to e)" as stated.

13. The disclosure is further objected to because of the following informalities: on lines 14 and 15 of page 3 the "N" in "N times" and "N steps" apparently should be "M."

14. The disclosure is further objected to because of the following informalities: on line 15 of page 3, it appears that "at" is missing between the words "that" and "the." Also, the end of step f reads "steps saving test vectors T sub 0 to T sub M;." It appears that T sub 0 should be T sub 1 since T sub 0 is the initial set of vectors. Also, this phrase should be changed to something clearer, such as "steps, test vectors T sub 1 to T sub M are saved;."

15. The disclosure is further objected to because of the following informalities: on line 20 of page 3, the phrase " appending vector sets V sub M to V sub 0" is unclear

language. It apparently should read something like "V sub M through V sub 0" to describe the correct operation.

16. The disclosure is further objected to because of the following informalities: note the phrase on line 21 of page 3 "a) to f) M is 10 and these steps are therefore repeated ten times." Steps a and b do not need to be repeated 10 times. Only steps c to f need to be repeated.

17. The disclosure is further objected to because of the following informalities: the phrase "fault list G sub 0" on line 26 of page 3 should apparently be "fault list G sub M" to agree with line 19 on page 5 where the specification states that "the original fault list F sub 0 is again copied and denoted as fault list G sub M." See also item 2 of this Office Action.

18. The disclosure is further objected to because of the following informalities: line 3 of page 4 states that "steps g) to i)" should be repeated. It appears that it should read "steps j) and k)" because only those 2 steps need to be repeated to remove the duplicate vectors.

19. The disclosure is further objected to because of the following informalities: line 8 of page 4 refers to Figure 1 as a depiction of one test vector even though Figure 1 contains 2 test vectors or prior art scan chains.

20. The disclosure is further objected to because of the following informalities: line 13 of page 4 states that "Figure 3 is a legend to terms used in the flow chart of Figure 1." This should apparently read "Figure 3 is a legend to terms used in the flow chart of Figure 2," because Figure 2 is the flow chart and Figure 1 is the prior art test vectors.

21. The disclosure is further objected to because of the following informalities: the phrase "(steps a) to f)" on line 24 of page 4 appears to be missing a closing parenthesis.

22. The disclosure is further objected to because of the following informalities: the phrase "repeated N times" on line 11 of page 5 should apparently be "repeated M times."

23. The disclosure is further objected to because of the following informalities: the phrase "completion of step 12" appears to be missing reference to the number of times it was repeated. The phrase should be changed to something clearer, such as "completion of the 10th (or Mth) step 12."

24. The disclosure is further objected to because of the following informalities: the word "G sub N+1" on line 25 of page 5 should apparently be changed to "G sub N-1" to agree with the disclosed step k and Figure 2b.

25. The disclosure is further objected to because of the following informalities: the phrase "with M taking" on line 26 of page 5 should apparently be "with N taking."

26. The disclosure is further objected to because of the following informalities: the meaning of the equation $(X^N)^{2^N}$ on line 26 of page 5 was not clear. Further explanation of what value the exponent takes on is needed. The figures and specifications use 2^N and the claims use X^N with $X=2$, but the specifications only speak of varying the value of the probability by changing X. There is no reference as to whether the exponent value changes or is fixed.

27. The disclosure is further objected to because of the following informalities: the phrase "the list of undetected faults is saved as G sub N+1" on line 25 of page 4 of the

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specifications apparently should be changed to "the list of undetected faults is saved as G sub N-1" to agree with Figure 2b (step 16).

Appropriate corrections are required.

Claim Objections

28. Claims 1-7 are objected to because of the following informalities: the claims are not the object of a sentence starting with "I (or we) claim," "The invention claimed is" (or the equivalent). See MPEP 608.01(m).

29. Claims 1 and 6 objected to because of the following informalities: "where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation." See MPEP 608.01(m) or 37 CFR 1.75(i).

30. Claim 1 is objected to because of the following informalities: the phrase " any faults, and" on line 2 of step 3 should be "any faults;."

31. Claim 1 is further objected to because of the following informalities: it appears that the phrase " steps a) to e)" on line 2 of step f should be "steps c) to f)." Also, the phrases "N times" on line 2 of step f and "N steps" on line 3 of step f should apparently be "M times" and "M steps." Also, it appears that the phrase "that the" on line 4 of step f is missing "at" between the two words. The phrase should read "that at the." Also, the phrase "vectors T sub 0 to T sub M" should be "vectors T sub 1 to T sub M" since T sub 0 is initialized at the beginning of the method and therefore does not need to be saved. Also the phrase "so that at the end of M steps saving test vectors T sub 1 to T sub M" should be changed to something clearer such as "so that at the end of M steps, test vectors T sub 1 to T sub M are saved;."

32. Claim 1 is further objected to because of the following informalities: including the above-suggested corrections to step f in item 31, it appears that step f should be split into two steps, f and f'. A suggestion for step f is "saving the remaining vectors as vector set $T_{sub\ N}$;" while a suggestion for step f' is "repeating the above steps c) to f) M times with N having a value of 1 to M so that at the end of M steps, test vectors $T_{sub\ 1}$ to $T_{sub\ M}$ are saved;". If step f is not split into two steps, only vector set $T_{sub\ 1}$ will be saved.

33. Claim 1 is further objected to because of the following informalities: the phrase "vector set $T_{sub\ N}$, and" on line 2 of step g should be "vector set $T_{sub\ N}$; and."

34. Claim 1 is further objected to because of the following informalities: the phrase " $V_{sub\ M}$ to $V_{sub\ 0}$ " should be changed to " $V_{sub\ M}$ through $V_{sub\ 0}$ " to be sure to describe appending all M+1 vector sets and not just $V_{sub\ M}$ and $V_{sub\ 0}$.

35. Claim 1 is further objected to because of the following informalities: in step h, the contents of vector sets $V_{sub\ M}$ through $V_{sub\ 0}$ needs to be specified. More specifically, how are the vector sets created and what their contents are before they are appended together. A possible suggestion for step h is "saving the duplicate free vector set $T_{sub\ N}$ as $V_{sub\ N}$ with N having a value of 1 to M, initializing the final vector set, and then vector sets $V_{sub\ M}$ through $V_{sub\ 0}$ are appended to produce a final vector set $T_{sub\ F}$."

36. Claim 1 is further objected to because of the following informalities: in step d, the phrase "forming a vector set" needs to be described. The method used to form the vector set was never disclosed in the specifications.

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37. Claim 2 is objected to because of the following informalities: the phrase "steps a) to f)" should apparently be "steps c) to f)" because steps a and b are not required to be repeated M=10 times.

38. Claim 6 is objected to because of the following informalities: the vector set "G sub 0" in line 2 of step i should be "G sub M."

39. Claim 6 is further objected to because of the following informalities: the phrase "g) to i)" in line 1 of step L should be "j) and k)" because only those two steps need to be repeated.

40. Claim 6 is further objected to because of the following informalities: each claim begins with a capital letter and ends with a period. At the end of step L, there should be a "." following the phrase "M to 0" instead of a ";;."

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

41. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

42. Claims 3 and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Both claims state a probability of X^{-N} while the specifications state the probability factor as being both 2^{-N} and $(X^{-N})2^{-M}$. In the scope of the claims, N does not

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necessarily have to equal M since N will increase from 1 up to M while M will always be a constant. Please specify which variable, M or N, is to be used as the exponent of the probability factor.

Claim Rejections - 35 USC § 103

43. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

44. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chakradhar (U.S. Patent Number 5,983,381) in view of Bowden (U.S. Patent Number 6,052,809) and Rohrbaugh (U.S. Patent Number 6,067,651).

Chakradhar substantially teaches:

“a method of maximizing the fault coverage on an integrated digital circuit by re-ordering a number of test vectors for testing the digital circuit”

In lines 25-28 of page 4, Chakradhar teaches reordering of the test set by moving sequences of vectors from the end to the beginning of the test set. Chakradhar also states the desirableness of compacting the modified (reordered) test set by removing duplicate fault detectors (lines 59-62 of page 3). In lines 33-35, Chakradhar teaches maximizing the fault coverage: “all target faults are still detectable because the original test set is a subset of the modified [reordered] test sequence.” If all of the original faults are still detected, but with a smaller test set size, then fault coverage is maximized.

“providing an initial set of test vectors $T_{sub\ 0}$,”

In lines 21-22 of page 3, Chakradhar teaches of an initial test set by stating
“Given a test set T .”

“providing an original set of faults $F_{sub\ 0}$,”

In lines 22-24 of page 2, Chakradhar teaches of an original set of faults: “The first $x\%$ of the vectors detect $y\%$ of the faults.” Since Chakradhar is stating that a certain percentage of faults are detected, then an entire original fault list must be known.

“forming a vector set $T_{sub\ N-1}$ and simulating the vector set $T_{sub\ N-1}$
against fault list $F_{sub\ N}$,”

and

“discarding any vector from the vector set $T_{sub\ N-1}$ which does not detect
any faults;”

and

“removing duplicate vector patterns in each vector set $T_{sub\ N}$,”

In lines 64-67 of page 4, Chakradhar teaches of “fault simulation of the modified test sequence will determine whether some vectors can be removed.” The modified test sequences are the reordered and compacted test sets. These sets are fault simulated against the fault list, or some percentage of the fault list, to determine which test vectors can be removed because they are either a) a duplicate fault-detecting vector (lines 53-55 of page 4 and lines 59-62 of page 3) or b) a non fault-detecting vector (lines 17-18 of page 6).

"initializing the final vector set and appending vector sets $V_{sub M}$ through $V_{sub 0}$ to produce a final vector set $T_{sub F}$."

In lines 54-59 of page 3, Chakradhar teaches of appending " $T_{sub compact}$ to the first sequence $T_{sub [v_{sub 1}, \dots, v_{sub i}]}$. This ensures that all target faults f are detected." By appending the partitioned sets together and removing duplicate detectors and non-detectors, Chakradhar is left with a single compacted vector set that is capable of detecting all of the target faults.

Chakradhar does not teach of selecting faults at random, saving fault detecting vectors, or of repeated simulation.

Rohrbaugh, in an analogous art, teaches:

"selecting faults at random from the original fault list to form a sample fault list $F_{sub N}$ "

In lines 2 and 3 of claim 1 step b, Rohrbaugh teaches of creating necessary inputs "to detect a target fault selected from the list of faults." In step d, Rohrbaugh also teaches creating new inputs "to detect a target fault selected from the list of faults, and other than one marked as detected." In step f, Rohrbaugh teaches to repeat step d. Rohrbaugh's method will create a sample fault list by selecting faults at random from the original fault list.

Bowden, in an analogous art, teaches:

"saving the remaining vectors as vector set $T_{sub N}$, repeating the above steps a) to e) N times with N having a value of 1 to M so that the end of N steps saving test vectors $T_{sub 1}$ to $T_{sub M}$ "

In steps d and e of claim 1, Bowden teaches that "if fault coverage increase, saving the stimulus pattern and the expected output." When fault coverage increases during fault simulation (i.e. a vector has detected a new fault) Bowden will only save the test patterns that detect faults (ignoring vectors that do not detect faults or detects a duplicate fault). Bowden also teaches of "creating a list of undetected faults" (see claim 10 step c2) and how "fault coverage increases when the number of undetected potential faults in the list of undetected potential faults decreases." Further, in claim 12, Bowden teaches that "if the number of undetected potential faults in the list of undetected potential faults is greater than or equal to one, optionally repeating" fault simulation. By maintaining the list of undetected faults, Bowden has the option to repeat the steps as long as there exists a single undetected fault. Since it is optional, one may choose to stop when they are satisfied with the fault coverage.

One skilled in the art at the time the invention was made would replace Chakradhar's step of selecting a certain percentage of faults with the teachings of Rohrbaugh to create random fault lists so as to be able to have a separate fault list for each partition. One skilled in the art would do this to take advantage of Chakradhar's method of compaction by fault simulating the different partitioned test sets against different randomized fault lists. Because each partition will be significantly smaller than the original test vector set, the time needed to test each partition will be much smaller as well. Once the partitions are fault simulated, they are appended together, removing any duplicates so as to obtain maximized fault coverage with a smaller test vector set size.

One skilled in the art at the time the invention was made would add to Chakradhar's step of removing non-contributing vectors by adding the teachings of Bowden to save only the test patterns that increase fault coverage (i.e. patterns that detect a new fault) and to remove duplicate fault detecting vectors through repeated fault simulation and shrinking of the size of the undetected fault list. One skilled in the art would apply Bowden's teachings to ensure that only test vectors that detect new or distinct faults (not duplicate faults) are saved, thereby maximizing the fault coverage of the test set.

45. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chakradhar (U.S. Patent Number 5,983,381) in view of Bowden (U.S. Patent Number 6,052,809).

Chakradhar teaches:

"remove duplicate vectors"

In lines 17-18 of page 6 Chakradhar, teaches "fault simulation is again applied to remove any non-contributing vectors from the first partition." Here, Chakradhar will remove any vectors that do not detect new faults. These types of vectors include both identical and different vectors that detect the same fault and vectors that do not detect any faults.

"fault simulating vector set $T_{sub N}$ against $G_{sub N}$ and deleting any vectors which find no faults"

In lines 64-67 of page 4, Chakradhar teaches of "fault simulation of the modified test sequence will determine whether some vectors can be removed." The modified test

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sequences are the reordered and compacted test sets. These sets are fault simulated against the fault list, or some percentage of the fault list, to determine which test vectors can be removed because they are either a) a duplicate fault-detecting vector (lines 53-55 of page 4 and lines 59-62 of page 3) or b) a non fault-detecting vector (lines 17-18 of page 6).

Chakradhar does not teach of copying the original fault list, saving the resulting vectors, saving the list of undetected faults, or of repeating the above steps.

Bowden, in an analogous art, teaches:

“copying the original fault list $F_{sub\ 0}$ to provide a secondary fault list $G_{sub\ M}$ ”

In claim 19, Bowden teaches a “means for fault simulating the digital electronic circuit for determining whether at least one of a plurality of potential faults is detected” and a “means for creating a list of undetected potential faults.” As Bowden copies the list of potential faults minus the just detected faults, he is essentially copying the original fault list and then removing previously detected faults.

“saving the resulting vectors as vector set $V_{sub\ N}$ and saving the list of undetected faults as list $G_{sub\ N-1}$ ”

and

“repeating steps g) to l) $M + 1$ times with N having values M to 0”

In steps d and e of claim 1, Bowden teaches that “if fault coverage increase, saving the stimulus pattern and the expected output.” When fault coverage increases during fault simulation (i.e. a vector has detected a new fault) Bowden will only save the

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test patterns that detect faults (ignoring vectors that do not detect faults or detects a duplicate fault). Bowden also teaches of "creating a list of undetected faults" (see claim 10 step c2) and, in claim 11, how "fault coverage increases when the number of undetected potential faults in the list of undetected potential faults decreases." Further, in claim 12, Bowden teaches that "if the number of undetected potential faults in the list of undetected potential faults is greater than or equal to one, optionally repeating" fault simulation. By maintaining the list of undetected faults, Bowden has the option to repeat the steps as long as there exists a single undetected fault. Since it is optional, one may choose to stop when they are satisfied with the fault coverage.

One skilled in the art at the time the invention was made would replace Chakradhar's step of always maintaining the entire fault list with Bowden's teachings of copying the original fault list minus any detected vectors. One skilled in the art would do this to keep only the undetected fault list to make the list smaller and hence take less time to search. During Chakradhar's method, if the fault list contained only undetected faults, the time to determine if the vector detected none or duplicate faults would be greatly reduced. Instead of traversing the entire fault list looking for duplicates, the new method would only need to traverse a fraction of the list because only undetected faults would be listed.

Also, one skilled in the art at the time the invention was made would add to Chakradhar's step of removing non-contributing vectors by adding the teachings of Bowden to save only the test patterns that increase fault coverage (i.e. patterns that detect a new fault) and to remove duplicate fault detecting vectors through repeated

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fault simulation and shrinking of the size of the undetected fault list. One skilled in the art would use Bowden's teachings to ensure that only test vectors that detect new or distinct faults (not duplicate faults) are saved, thereby maximizing the fault coverage of the test set.

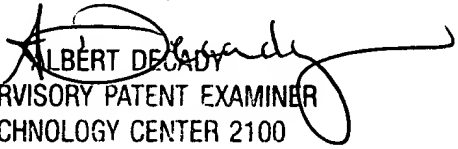
Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yonetoku describes random fault selection and fault simulation and Hsiao describes test sequence compaction, vector deletion, and vector reordering.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marshall S Eng whose telephone number is (703) 305-4638. The examiner can normally be reached on Monday – Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3718 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.


ALBERT DECADY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

mse 
June 27, 2003